

036



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Patrick C. Chou et al. Art Unit : Unknown
Serial No. : 09/785,039 Examiner : Unknown
Filed : February 15, 2001
Title : COMPENSATING POLARIZATION MODE DISPERSION IN FIBER OPTIC
TRANSMISSION SYSTEMS

Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Prior to examination, please amend the application as follows:

In the claims:

Cancel claims 3, 5, 25 and 27.

Please amend claim 1 as follows:

1. (Amended) An optical compensating apparatus comprising:

a polarization controller configured to receive an optical signal propagating through an optical medium, determine the principal states of polarization of the optical medium, determine a magnitude of time delay between the principle states of polarization, and transform the optical properties of the optical signal based on the principal states of polarization, wherein the polarization controller comprises a central processing unit programmed to monitor the time averaged state of polarization of the optical signal and determine the principle states of polarization of the optical medium and the magnitude of time delay between the principle states of polarization based on the time averaged state of polarization.

CERTIFICATE OF MAILING BY FIRST CLASS MAIL

I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, Washington, D.C. 20231.

Date of Deposit

April 25, 2001

Signature

Megan O'Meara
Megan O'Meara

Typed or Printed Name of Person Signing Certificate

09785039-042701

Please amend claim 4 as follows:

4. (Amended) The apparatus of claim 1, wherein the central processing unit analyzes time averaged states of polarization via the relationship, $DOP = |\vec{r}_k| = \frac{1 - |\vec{a}|^2}{|\vec{r}_k - (\vec{a} \cdot \hat{e}_k)\vec{a}|}$, to determine the principle states of polarization by calculating the vector \vec{a} .

Please amend claim 6 as follows:

6. (Amended) The apparatus of claim 1, wherein the central processing unit is further programmed to determine the relative order, in time, of the principle states of polarization.

Please amend claim 20 as follows:

20. (Amended) An optical compensating apparatus for reducing PMD in an optical signal transmitted through an optical medium, the apparatus comprising:

a polarization module configured to receive an optical signal propagating through the optical medium, determine the principal states of polarization of the optical medium, determine a magnitude of time delay between the principle states of polarization, and generate a signal for transforming the polarization of the optical signal; and

an optical transformer arranged in an optical path of the medium after the polarization module and configured to transform the optical signal and reduce a time delay between the principle states of polarization based on the signal received from the polarization module.

Please amend claim 24 as follows:

24. (Amended) A method of reducing PMD of an optical signal propagating in an optical medium, the method comprising:

determining the principal state of polarizations of the optical medium with a polarization controller,

determine a magnitude of time delay between a first principle states of polarization and a second principal state of polarization with the polarization controller, and

transforming the polarization of the optical signal with a polarization transforming device based on the polarization of the principal states of polarization.

09785039-042761
FD-2240-55058460

Applicant : Patrick C. Chou et al.
Serial No. : 09/785,039
Filed : February 15, 2001
Page : 3

Attorney's Docket No.: 01997-296001 / MIT 8471 CIP

Please amend claim 26 as follows:

26. (Amended) The method of claim 24 further comprising delaying the first principal state of polarization with respect to a second principal state of polarization.

09785039-042701

Applicant : Patrick C. Chou et al
Serial No. : 09/785,039
Filed : February 15, 2001
Page : 4

Attorney's Docket No.: 01997-296001 / MIT 8471 CIP



REMARKS

Applicants have amended claims 1, 4, 6, 20, 24, and 26, and canceled claims 3, 5, 25 and 27. Attached hereto is a marked-up version of the changes being made by the current amendment.

Applicant asks that claims 1, 2, 4, 6-24, 26, and 28-34 be examined. Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: _____

Apr. 1 25, 2001

A handwritten signature in black ink, appearing to read "Eric L. Prahl".

Eric L. Prahl
Reg. No. 32,590

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906

20245485.doc

09785039 042701
F02240" 65058260



Version with markings to show changes made

In the claims:

Claims 3, 5, 25 and 27 have been cancelled.

Claim 1 has been amended as follows:

1. (Amended) An optical compensating apparatus comprising:

a polarization controller configured to receive an optical signal propagating through an optical medium, determine the principal states of polarization of the optical medium, determine a magnitude of time delay between the principle states of polarization, and transform the optical properties of the optical signal based on the principal states of polarization, wherein the polarization controller comprises a central processing unit programmed to monitor the time averaged state of polarization of the optical signal and determine the principle states of polarization of the optical medium and the magnitude of time delay between the principle states of polarization based on the time averaged state of polarization.

Claim 4 has been amended as follows:

4. (Amended) The apparatus of claim [3] 1, wherein the central processing unit analyzes time averaged states of polarization via the relationship, $DOP = |\vec{r}_k| = \frac{1 - |\vec{a}|^2}{|\vec{r}_k - (\vec{a} \cdot \hat{r}_k)\vec{a}|}$, to determine the principle states of polarization by calculating the vector \vec{a} .

Claim 6 has been amended as follows:

6. (Amended) The apparatus of claim [3] 1, wherein the central processing unit is further programmed to determine the relative order, in time, of the principle states of polarization.

Claim 20 has been amended as follows:

20. (Amended) An optical compensating apparatus for reducing PMD in an optical signal transmitted through an optical medium, the apparatus comprising:

09785039-042701

a polarization module configured to receive an optical signal propagating through the optical medium, determine the principal states of polarization of the optical medium, determine a magnitude of time delay between the principle states of polarization, and generate a signal for transforming the polarization of the optical signal; and

an optical transformer arranged in an optical path of the medium after the polarization module and configured to transform the optical signal and reduce a time delay between the principle states of polarization based on the signal received from the polarization module.

Claim 24 has been amended as follows:

24. (Amended) A method of reducing PMD of an optical signal propagating in an optical medium, the method comprising:

determining the principal state of polarizations of the optical medium with a polarization controller,

determine a magnitude of time delay between a first principle states of polarization and a second principal state of polarization with the polarization controller, and

transforming the polarization of the optical signal with a polarization transforming device based on the polarization of the principal states of polarization.

Claim 26 has been amended as follows:

26. (Amended) The method of claim [25] 24 further comprising delaying the first principal state of polarization with respect to a second principal state of polarization.

09785039-04704